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MARSHALL H. EDWARDS

Prominent in Florida citrus circles, national farm credit association affairs and a well known Florida attorney. (See page 7.)

VOL. 42 — NO. 6 JUNE, 1961 BARTOW, FLORIDA

IT'S LATER THAN YOU THINK...

From where we're sitting, it looks as though good quality citrus nursery stock will be in short supply for the 1961-62 planting season. Some varieties on some rootstocks are already sold out and orders are now being placed for June, 1962, delivery. If you're thinking about planting a grove in the next 12 months, don't wait too long to reserve your trees. It's later than you think—and it may be too late before you know it.

OUR FOLLOW-UP POLICY

To our way of thinking, our responsibility to our customers does not end with the sale of trees. We like to follow up the sales to see that the trees are planted right, are being watered, cultivated and fertilized. Many times we see things happening (or not happening) which we can call to the grower's attention. We like to see the trees we sell make a vigorous bearing grove. And they will not do it, without proper care. Following up a sale, we think, serves our growers and keeps us satisfied that our trees are getting off to a good start.

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Florida Can Market A 125-Million Box Orange Crop

ADDRESS BY

MARTIN E. HEARN
DIRECTOR INTERNATIONAL TRADE DIVISION
FLORIDA CITRUS MUTUAL

BEFORE 16th ANNUAL GULF GROWERS INSTITUTE, DADE CITY

I am glad of this opportunity to address the citrus growers of this area at their Annual Institute, and to give you Florida Citrus Mutual's considered evaluation of what lies ahead when present new plantings come into bearing.

Certainly none of us presume to forecast the future with a full measuse of accuracy—there are too many unpredictables such as freezes, hurricanes, flood rains, drought, boom times, recessions that are liable to affect production or demand. But, taking the population trends, and long-term production norms, we can look to disposing of larger orange crops with confidence and optimism.

Let us take a look at our present crop—89,500,000 boxes of Early, Mid-Season, Valencias and Temples to be consumed by 182,500,000 people; based on a 90-lb. box, this represents a per captia consumption of 44.13-lbs, either in concentrate, fresh, salad and chilled juice form. In this per capita consumption figure, possibly the most significant factor has been the astronomical increase in the per capita consumption of frozen orange concentrate; in 1951, the U. S. consumption was 7.22 pounds per person.

Eight years later, the figure was 16.64 pounds, while every other fruit or juice remained stationary. One of the big factors contributing to this increase has been the marked change in living patterns and trend towards labor savings devices, convenience foods brought on by the increase in the ranks of married working women who simply do not have time to prepare elaborate breakfasts for their families. What the housewife is doing when purchasing frozen concentrate is buying "canned time", combined with health, ease of preparation and an all-round acceptance of orange juice as a palatable pleasant drink by children and grown-ups.

There is no question that the per capita consumption of frozen orange concentrate will continue to climb rapidly—our domestic pattern, geared to the family automobile and the refrigerator virtually dictate this trend.

Some 10 years ago when frozen concentrate was first introduced, a well-known personality observed, "I doubt if it will catch on. It's tied to the refrigerator . . ." The statistics clearly disprove this prediction, and the family habit of Friday night shopping at the supermarket when an entire week's groceries can be conveniently loaded into the car and stored in the freezer section of the refrigerator will tend to make frozen orange concentrate an even more popular item with the American consumer in the years ahead.

Also of considerable significance in the national citrus production is the fact that our biggest competitor, California, has a definite downward trend in production. This season's estimate of all varieties produced on the West Coast is less than 50 per cent of its peak production of 17 years ago when their crop exceeded 60 million boxes, the bulk of it going out in fresh form. This drop in production has a two-fold effect on Florida—it relieves competition in our own fresh orange market, as well as converting many American consumers to frozen concentrate.

Until now, consumer advertising and promotion of concentrate has been directed primarily towards adults, but it is becoming more and more recognized that young children exert considerable influence on the housewife's choice and selection of food items, especially those advertised on TV through special children's programs.

If the successful sales records of breakfast cereals, candies, and popular children's meat items like frankfurters are any reliable criteria, the Florida citrus industry has an immense potential outlet in the toddler and youth market with a sound and legitimate health message. The February, 1961, census figures show, out of a total population of 182,498,000 people, 55,571,000 are under 14 years of age or slightly more than 30 per cent.

In 7 years, this country's population will attain 204,000,000, of which an estimated 26,000,000 will be less than 8 years old and another 39,000,000 will fall into the 8 to 13-year category—all of them a receptive audience for orange juice on a repeat sustained basis.

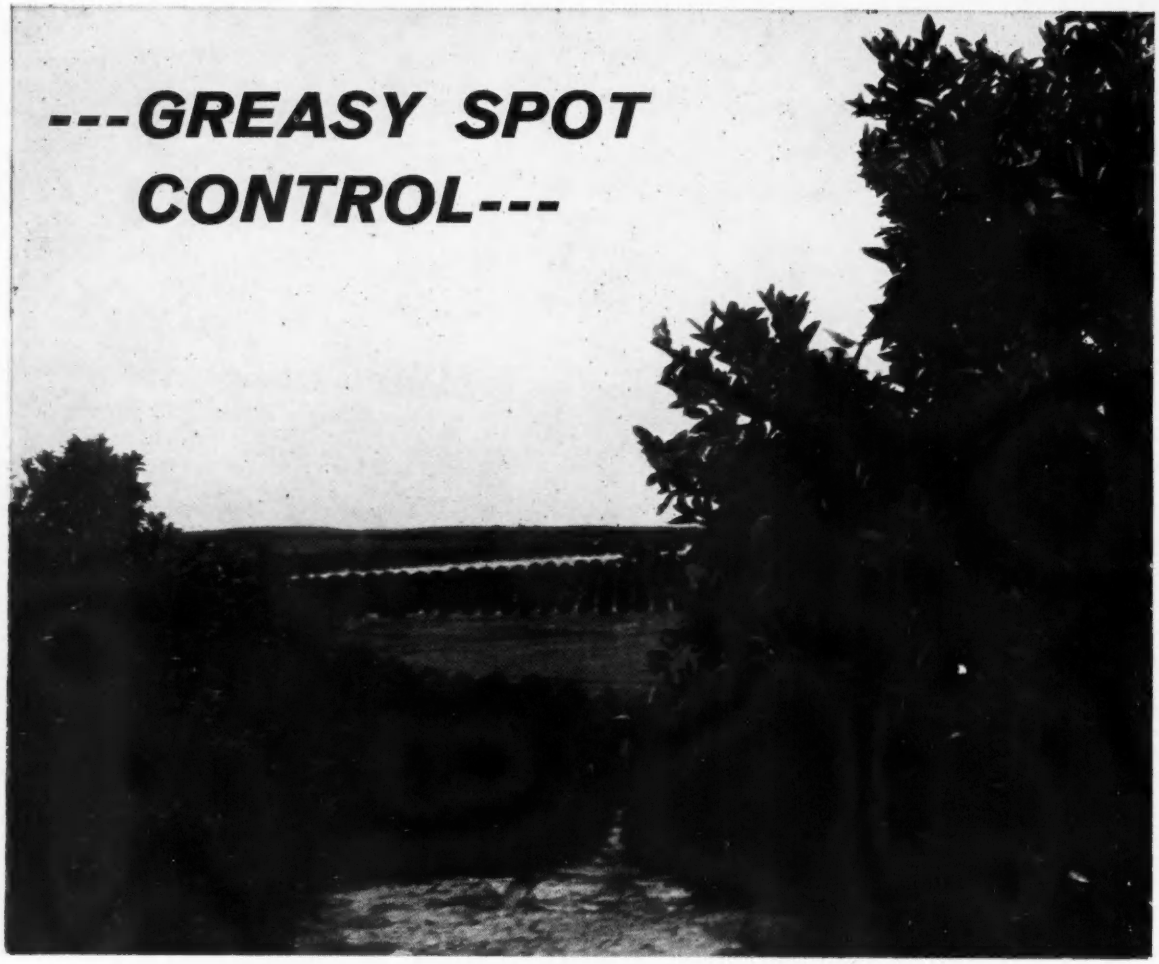
When does Florida expect to have a 125,000,000 box crop? Depending upon such unknown and capricious factors as weather, this figure should be reached between 1967 and 1969 seasons (about the same time our population touches 204 million). This means then, approximately 55.15 pounds of orange products per capita—not by the wildest stretch of the imagination an unmanageable figure, and **which does not take into account the increase in population and consumption of our major export market, the Dominion of Canada,** whose present purchases of orange concentrate alone exceed 3 million gallons annually, with an annual per capita consumption of all Florida orange products of 8.97 pounds.

With frozen locker space in the supermarket becoming increasingly valuable, Florida processors are devoting more attention to the possibilities of a higher density concentrate. Several firms have been active in research to produce concentrate with reconstitution ratios of 7:1 whose stability is such that it will not require deep freezing at below zero temperature but will maintain an indefinite shelf life at 38°F.

The consequent savings in cold storage, freight containers can be passed on to the consumer without affecting the growers returns, but it

(Continued on Page 10)

USE THE PRODUCT PROVEN BEST FOR



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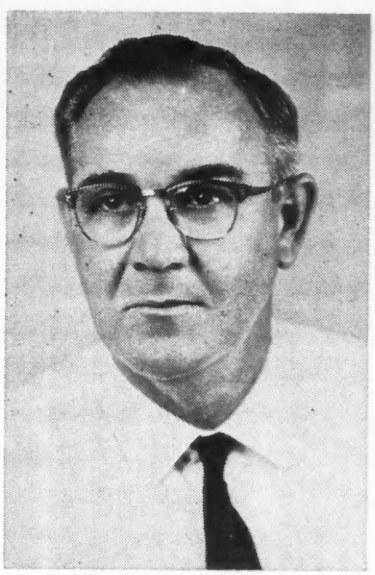
Management Problems In Old Citrus Groves

. . . BY . . .



FRED P. LAWRENCE
CITRICULTURIST
16th ANNUAL GULF COAST GROWERS INSTITUTE
APRIL 28, 1961

Today I find myself in a predicament somewhat similar to the town gossip who observed the preacher's car parked in front of a bar. She went about town spreading the rumor that the preacher had spent the entire afternoon in the bar. Upon hearing the rumor the preacher decided drastic action should be taken immediately. Early that evening he parked his car in front of the lady gossip's home and left it over-night.

In handling the subject of management problems in old citrus groves, we fear the car has been parked in front of us! In an effort to establish a point of departure we must first decide what constitutes an old grove. Most growers will agree that a 25 year old citrus tree is a mature tree. Let us assume then that trees above this age can be called old trees.

In an attempt to decide the scope of the problem we must know just how many acres of such trees there are in Florida. For this, we called on our friend Zach Savage who has kept books on Florida citrus for more than a quarter century. Zach produced figures, based on an old USDA report, indicating there were 266,000 acres of bearing citrus in Florida during the 1934-35 season.

Assuming a 1½% annual tree loss, which Zach feels is about right, we wind up with some 165,000 acres of trees that are actually 26 years of age or older. Certainly there are management problems in all groves of this age but we do not intend to infer that all groves over 25 years of age are problem groves. We do say, however, **some are**, and these should receive our immediate attention.

The problem of fluctuating production and an increasing unit cost of production are prime concern in many of these groves today. However, in light of present prosperity and good grower returns we are inclined to think of these in terms of operational hazards. This is largely because during recent years one could show a substantial profit on a rather unproductive grove and unit cost has been more or less forgotten. **This could change.** Then, no doubt, these groves will become economic hazards.

Management problems in old groves can range from the rather simple problems of fertilization, pH control, insect and disease control, to complex problems of soil unbalance, drainage, viruses, declines of various types, crowding and finally a state of senility or unproductiveness.

Senile trees are characterized by sparse foliage of poor quality, low yields and usually the upper 1/3 of the tree is, for all practical purposes, worthless. What can be done about this? It would appear the grower has three choices:

1. Do nothing. Just follow the same old program and be alert for a byuer to unload the grove on.
2. Treat the trees in place.

or

3. Plow up and replant.

Since it is and has been a sellers' market for so long, number one, at three to four thousand dollars per acre, is the simplest choice. But for some reason few "died in the wool" citrus growers follow this course. They much prefer the challenge of

the second choice — treatment in place, and equally as strange, few, if any, consider pulling and burning, unless it is a proven case of spreading decline. So long as the trees are alive the veteran grower has confidence he will make it productive again.

Quite frankly, many do. Even so, would it not be wiser to consider replacement? Especially in light of better rootstocks, clean budwood, improved varieties, better spacings, and the opportunity to treat the soil for insects, disease and nematodes; the opportunity to improve needed drainage; to change the bedding system as well as an opportunity to thoroughly treat the soil; add needed soil amendments and many other opportunities that cannot be done without removing the trees.

We believe it would be to many growers advantage to consider a program of replacement rather than to develop some of the newer and less desirable areas now being planted to citrus. That's our thought for the day.

Now, when we consider treating in place these old "scraggly" topped trees — here again we have three choices:

1. Change the cultural program — in accord with what is thought to be wrong; this is known as the trial and error method and is seldom rewarding.
2. Make a thorough study of the situation in the light of available research and good grower practices.

or

3. Try everything everyone suggests — you'd be surprised!

Number two seems to be the logical approach. Certainly a thorough study of the root system, soil and tree should be made. Is the pH favorable? Is there adequate drainage? Are there insects or diseases or nematodes? Are the soil nutrients in balance? Is the root growth adequate? Are there viruses, foot rot, etc?

For the sake of time — let us assume that no fault has been found and the trees still look bad. What then? Did you ever hear about the first grader who on his first day in school stubbed his toe and fell flat on his face? Teacher helped him up, held him to her and said, "That's all right sonny. I know it hurt, go ahead and cry." "Cry **heck**," he replied, "some one is going to get sued!" Realizing these possibilities, we warn you that the title of this talk has suddenly been changed to "This I Believe!"

Our first belief is that **some** Florida growers apparently don't care how tall their trees grow or how "scroungy" the tops may look.

Suit and Knorr (1) in their 1949 survey of 387 Florida groves stated there were at least 10 common conditions or diseases which were causing decline. The top four listed were: spreading decline, root rot, foot rot, and water damage. They also found that at least one of these four types was present in 81% of all groves examined. Nowhere did they list old age. This is to be expected since citrus trees never die from old age — especially in Florida!

It seems that most citrus growers have been prone to overlook one basic horticultural principle. This was pointed out by Moore and Nawer (2) in their studies of **Declining Yields in California Oranges.** That is, with age, the renewal rate of bearing wood decreases and the non-productive wood increases. This non-productive wood competes with fruiting wood for energy and nutrients. This fact is not new to Florida growers. In the old days, the first thing a grove manager or grower did when he took over an old grove was to prune it heavily and plow it deeply. Usually this produced the desired response.

Pruning for rejuvenation of old trees is a practice not too widely applied now in Florida. However, based upon limited observations, we feel that this practice has a very definite place in our grove management program today and for this reason we would like to discuss several forms of rejuvenation pruning. We propose to discuss: hedging – topping – cubing – skeletonizing – buckhorning and thinning by tree removal.

Zach Savage (3) in his mimeographed report "Citrus Yields Per Tree By Age" shows that there is very little increase in yield beyond a tree age of 20 to 25 years. Growers and production men are slowly awakening to the disturbing problem that **mature** groves, with interlocking limbs, not only make their every day jobs of cultivating — spraying and harvesting more difficult, but also create a problem of shading.

This shading reduces and ultimately eliminates cover crops that feed the bacterial life in the soil. This, in our opinion, compounds the management problem in these groves and usually it is in these crowded, shady groves that we find tree condition so poor. Hedging has been very beneficial in relieving some of these problems but it is our belief that we need to do something more.

Skeletonizing, is a form of rejuvenation pruning that has never been practiced to any extent in Florida. Basically it consists of removing all wood less than one inch in diameter. Admittedly, it does stimulate the tree but it is time consuming, expensive and of little lasting value.

Florida growers have turned mainly to "buckhorning" and thinning by tree removal as the principal means of stimulating new growth and relieving over-crowding. As the slides will reveal "buckhorning" works; but not without certain limitations. "Buckhorning" can be said to be a drastic means to a sometimes rather unrewarding end, unless certain safeguards against cold, sunburn and hurricanes are applied. Even then — we wonder if complete tree removal might not be the better approach. This largely depends upon the grower's age, his outlook and the soundness of the individual trees involved.

Turning now to thinning (usually by removing alternate trees) here we have numerous facts and figures on limited operations of this nature. Thinning holds much more promise of a continuing condition of economic improvement to relieve over-crowded citrus groves. Our office, through County Agent R. E. Norris, has been on the "ground floor" of two such operations. Although we have observed many others we have rather complete figures on these two. Through the use of five slides we will show you **before, during** and **after** the trees were removed in one of these groves.

The grove is a 10 acre block of Hamlins on Rough Lemon rootstocks planted in 1937 on Lakeland fine sand at a spacing of 15' x 25' with a tree count of 1,170 trees before thinning. It wound up with a spacing of 25' x 30' and 598 trees.

Maximum production of 6,679 boxes was obtained in 1953. Production dropped to 5,084 boxes in 1954 and to 2,886 boxes in 1955. In January of '55 alternate trees were removed. The 1956 production was 3,858; the '57 yield was 4,349 and production has steadily risen. The 1960 crop lacked only a few boxes of producing a nine-box per tree average on the 10 acres. The owner feels that the 1961 crop will rise well above a 10 box average.

As can be seen by the slides the trees have completely filled in and are well on their way to even greater production. The experienced grower

will also notice that the trees will soon need to be hedged through the 25' middle. It is not unrealistic to believe that topping may also soon be beneficial. Not only would it have a stimulating effect through the removal of old wood which is more or less parasitic on the tree, it would also lower the height of the tree, and afford better insect and disease control (Melanose and especially Greasy Spot). Most of all, yields would be increased through renewed tree vigor and the trees would be easier and cheaper to pick.

Next we show you three slides of Ruby Red Grapefruit trees that have been **cubed to** a height of 10' x 12' x 12'. The grove was planted in 1942. It was originally Hamlin on Rough Lemon. In 1948 the grove was topworked to red grapefruit. About seven years ago the owner began to hedge the trees. Two years later he started topping. At that time the yield was about eight boxes per tree. During the last five years he has cubed the trees each winter and annually he picks five to six boxes per tree. Production would be even greater but the grower thins the crop. When fruits are marble sized he eliminates all clusters. This is done to produce early large sized fruit that can be harvested while prices are good.

This practice allows the trees to rest and produce an early bloom for the next crop. You will note the unusually vigorous foliage in the last two slides. These pictures were taken only about 40 days after hedging and topping. Most of these trees will make two feet of side growth and the tops will extend three to five feet in a season. The owner does not recommend this severe an operation. He feels that a 10 foot tree is a little too severe — even though he has consistently received considerably more than average prices for his fruit. He feels the operation he is performing in a block of Marsh grapefruit is more nearly adequate.

In this block of Marsh on lemon planted in 1924, the production had steadily declined until the trees were producing only seven to ten boxes. Even after hedging the production didn't increase materially and the tree tops continued to look very ragged. Then he decided to top the trees. His first step was to lower the tree height by seven feet. This had the desired effect; the trees have filled out, the growth has continued to be of good quality and the trees are averaging 19 boxes. The grower continues to cube the trees each year. This is tree rejuvenation and we believe it will work for others.

In summary — we feel that hedging should be commenced just as soon as the branches begin to crowd and hinder cultivation. We are not so positive about topping because of limited observations but it would appear reasonable to commence when the trees are in the range of 10 to 15 feet high. This would eliminate the need for severe pruning and we believe it would eliminate or at least delay the forming of so much old unfruitful wood that becomes parasitic on the tree. A combination of hedging and topping — commonly referred to as cubing should begin about the same time. **Don't wait** for the branches to interlock from tree to tree and the tops to get bare.

"Buckhorning" will rejuvenate old trees but when a grower can afford it we feel he should consider a tree replacement program — that is instead of buckhorning, he should plan ahead and remove a certain percent of his most non-productive trees each year. This will allow the grower to take advantage of new varieties, rootstocks and more modern practices and he'll never have old grove problems!

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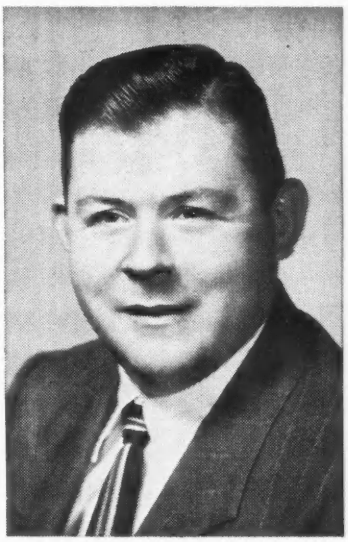
DR. WILLIAM G. LONG



Shown above is the picture of Dr. William G. Long, who is in the Market Quality Research Division, Agricultural Marketing Service of U.S.D.A. which should have appeared as co-author of the article "Two New Seedling Persian Limes" along with Dr. J. F. L. Childs in the May issue of The Citrus Industry, instead of the picture of Dr. Wally Long which appeared in error.

MARSHALL H. EDWARDS

M. H. Edwards, whose picture appears on the cover of this issue of The Citrus Industry has long been actively identified with citrus and agricultural affairs in this state and has taken a leading part in the instigation and development of national legislation dealing with the National Farm Loan Association.

In addition to being the owner of substantial grove interests in Florida, Edwards is listed in "Who's Who In America" in the 1960-61 issue which classified him as a lawyer and government official.

Born in Delhi, Ill., on June 27, 1902, the son of Fred M. and Lora Frances Edwards, he was married to Dorothy Johnston, Aug. 11, 1934. He was admitted to the Florida Bar in 1923, practicing law with the late R. B. Huffaker until 1940 and since that time has been in private practice.

He became a member of the Federal Farm Credit Board in 1953 and chairman of that group in 1958. He was president of the Polk county National Farm Loan Association from 1934 through 1954.

Evidence of his interest in and prominence in his chosen profession as well as in Farm Credit affairs, he has been member of the advisory and executive committees of the National Farm Loan Association, member of the Negligence and Compensation Lawyers association in Florida of which group he was president in 1952-53.

He is a member of the American and Florida bar associations and the American law institute, was graduated from the University of Illinois in 1923, where he was a member of Theta Chi, Pi Delta Epsilon and Phi Alpha Delta fraternities. He is a Methodist, Mason, Shriner, Elk and Kiwanian.

He maintains his law office and his home in Bartow.

Florida Citrus Growers

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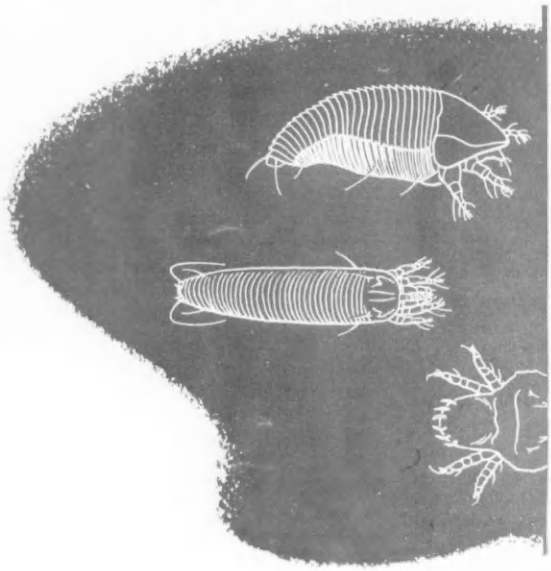

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Highlights Of Technical Papers Presented At 22nd Annual Meeting Soil Science Foundation, May 10th

. . . BY . . .

DR. O. C. BRYAN
TECHNICAL DIRECTOR

The Foundation is a non profit corporation organized by farmers and citrus growers to secure sound and scientific guidance regarding their soil and fertilizer needs. It operates on membership and special service fees, and not on public funds. To aid in its efforts to furnish dependable and practical information, the Foundation owns two groves devoted to research; one 20 acre grove in Lake County and one 40 acre grove in Manatee County.

In addition, a number of cooperative studies are conducted with members to aid in pinpointing problems and eliminate guesswork. The 20 acre grove in Lake County (Short Research Grove) is 21 years old, and the 40 acre grove in Manatee County is only one year old. Research studies in both groves are designed to furnish practical and dependable information to the industry.

In addition to the business affairs of the Foundation, progress reports were made on the following subjects at this meeting:

1. "Fertilizer Placement and Sources of Nitrogen for Young Trees," by H. E. Guilford. A series of systematic studies were conducted during the past year dealing with the comparative effects of (a) placing all of the fertilizer under the tree branches compared to (b) the same amounts of fertilizer spread over the root zone broadcast (extending 4 to 6 feet beyond the leaf drip) and (c) the normal practice of spreading the fertilizer 1½ to 2 feet beyond the leaf drip. Systematic measurements of tree spread showed no difference in growth and response during the year. A comparison of all inorganic nitrogen with 1/3 organic and 2/3 inorganic nitrogen showed no difference in the growth.

2. "The Effect of Foliar Sprays on the Solids of Early and Midseason Oranges," by Dr. C. N. Nolan, Assistant Technical Director. These studies included three representative foliar sprays including all fertilizer nutrients in a number of uniform groves in Polk, Lake and Marion counties. The sprays were in addition to fertilizer. The studies were conducted under practical grove conditions using appropriate checks and replications in a systematic manner, and the official method for measuring solids was used according to standard practice.

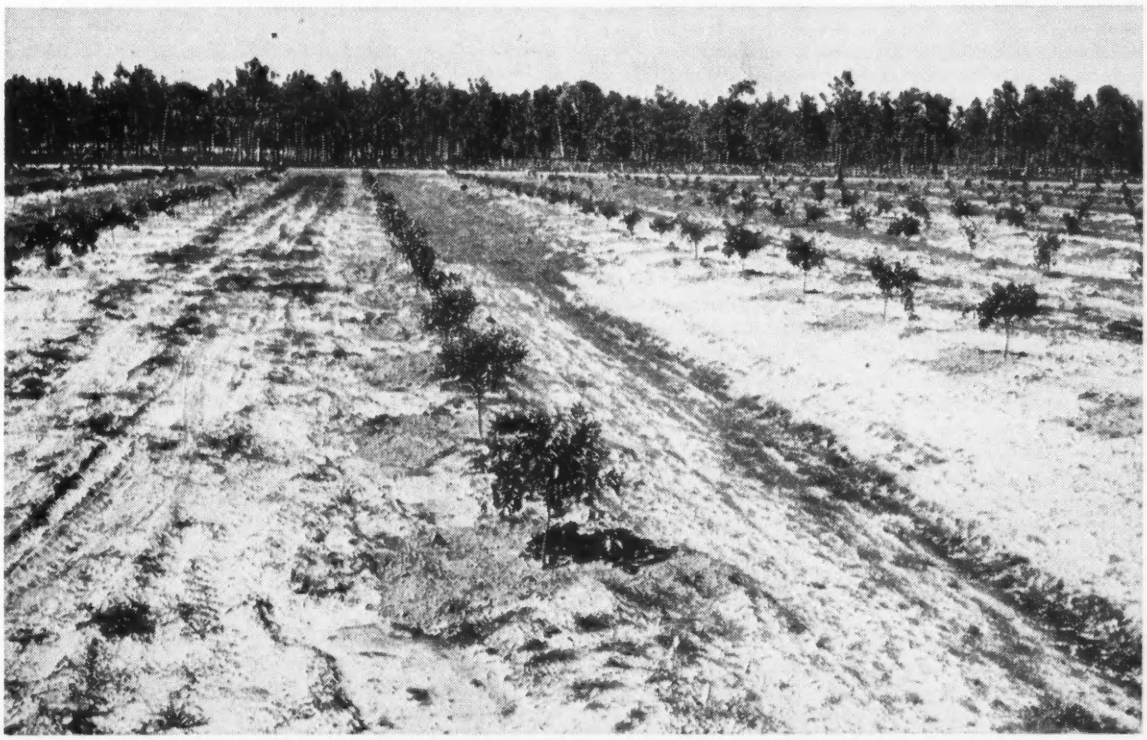

Figure 1 Duette Grove — Effect of Deep Plowing on the Cover Crop. Foreground — normal treatment; back, deep plowed. Photograph taken April 1961.

A careful study of the records showed no significant differences in any of the sprays on the amount of solids in the early and midseason fruit.

3. "Progress Report on the Duette Grove in Manatee County," by Dr. O. C. Bryan, Technical Director. This recently acquired grove for research purposes in the flatwoods contains a wide range of fertilizer treatments and soil preparation. Observations during the past year indicate that in spite of the heavy rains and hurricane, the tree growth was good, possibly above normal. One noted observation during the year was that of the favorable influence of the deep plowing, cutting and breaking the hardpan to a depth of 30 inches on tree response and cover crop.

The attached photograph shows the influence of the deep plowing on the cover crop. Although water was excessive at times, tree damage from water was relatively light. But the difference in response of soil types indicated differences in trees; some showed ammoniation (copper deficiency) and foot rot, but percentagewise, this was small. Tree conditions seem to be more favorable in the deep plowed areas than on the adjoining areas with normal treatments (disking or even breaking the subsoil without mixing). Since this is a new venture into flatwoods for citrus production, only time will tell the significance of these and other treatments.

4. "Rapid Tree Growth and Copper Needs," by R. S. Johnson. Following the vigorous flushes and growth in October 1960, some of the trees in the Duette grove showed symptoms of copper deficiency. Although this was localized according to soil types, it was decided to pinpoint the problem if possible. This was done by analyzing the leaves from the trees showing deficiency symptoms and comparing them with leaves from normal trees.

The records showed that the late fall growth on trees in 1960 showing deficiency symptoms of copper contained inadequate amounts of this nutrient, but the new flushes of growth in the spring of 1961 contained adequate amounts. Careful examination of the trees show that less than 1% of the trees were affected, and these were restricted to local areas (soil variations). The vigorous tree growth during the fall apparently created a need for above normal amounts of copper, more than .3 of one unit of CuO in an 8% nitrogen fertilizer will furnish on virgin flatwoods soil. Just why the deep plow reduced copper needs is not known.

FLORIDA CAN MARKET A 125-MILLION BOX ORANGE CROP

(Continued from Page 3)

is certain that when such pack becomes widespread, consumption of orange juice will jump throughout the country.

In hand with such newly-developed packs will go the increased realization of the value of merchandising, advertising and promotion. In this respect the recently-enacted Citrus Stabilization Act will prove its value by providing the entire industry with a flexibility and scope of action never before possible.

Premium offers, for example, hitherto ruled constitutionally illegal under the Citrus Code, can, under this new Act be carried out by the Florida Citrus Commission without technical difficulties. Special advertising campaigns can be initiated without having to wait for a meeting of the Florida legislature as has been the case up to now.

We sincerely believe this new Stabilization Act will eventually prove the greatest boon the Florida citrus growers have ever known — it will enable us to compete on equal terms with producers of other juices and fruits on a thoroughly business-like basis so that we can maintain and increase our share of the housewife's food budget.

New products and by-products, which presently account for approximately 5 to 10c per box of fruit, will also come in for intensified research in an effort to find additional uses and outlets. During this season, the largest supplier of bakers' specialties, such as candied fruits, preserves and pie fillings, relocated in Florida and expects to start the commercial production of pectin — formerly a California monopoly — from citrus fruits, within a year.

Every single citrus grower in Florida has a direct stake in all phases of this industry. No longer can he devote his sole attention to the raising of oranges, and expect some fairy godmother to dispose of his production without his taking an active interest in the various steps that will wind np with Mrs. America buying his fruit in preference to others.

Failure to recognize these important steps of marketing, distribution, and advertising and research spelled near-disaster to egg and vegetable producers in other areas, simply because they failed to recognize the revolution in retailing that has slowly and surely been taking place over the last ten years. The Florida citrus grower, though, is in a far more advantageous position than many of his agricultural colleagues, because, in Florida Citrus Mutual, he has an organization that keeps him informed on all developments, economic trends, price forecasts, legislation, distribution problems, new products, competitive activities and a host of other facts that enable him to make wise marketing decisions.

The Florida citrus grower has become of age; he has graduated from agriculture in "agribusiness" (to coin a term from Fred Lawrence) and now takes an active keen interest in every phase of the operation — from the grove to the grocery, the crop to the consumer.

All these factors — the increasing popularity of frozen concentrate, the immense untapped juvenile market potential, the future of citrus by-products, the growers' active participation in all industry matters — are positive, constructive contributions that will enable Florida to market profitably a 125-million box orange crop and for the grower to receive favorable prices for that fruit.

---

5. "A Progress Report Dealing With the Short Research Grove" was made by Dr. Nolan. The high point of the year's records there indicates that about .35 pound of nitrogen per box of fruit is sufficient for Pineapple oranges on Lakeland soils, and that .5 to .6 pound of nitrogen per box with a complete fertilizer may even be detrimental to the trees, besides being an additional cost to the grower.

6. "The Availability of Iron and Manganese From Fairfield Slag," by Dr. O. C. Bryan. This was a continuation of the studies dealing with Fairfield Slag reported a year ago. The records indicate that the availability of iron and manganese in Fairfield Slag is more favorable than had been anticipated.

Even with excessive amounts and at high soil pH values, annual crops (millet, Pangola grass and cowpeas) appeared to secure adequate needs of iron and manganese from the slag under controlled conditions. Although it is generally known that high soil pH values (pH 7.5 and above) hinder the availability of iron and manganese in most soils, only time can tell whether or not these records with Fairfield Slag will apply to field soils.

Advance registration indicates that attendance at Florida's 4-H camps will be at a record level this summer, according to Gordon White, assistant state boys' 4-H agent.

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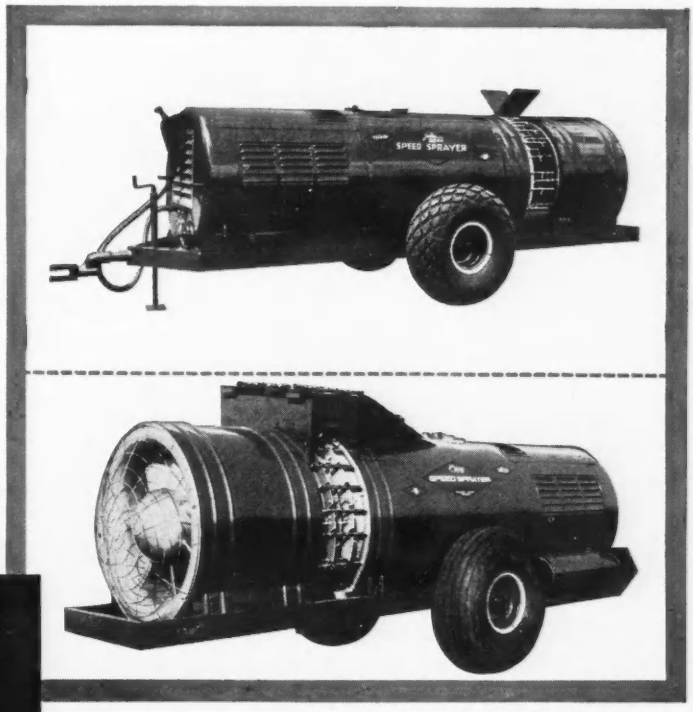

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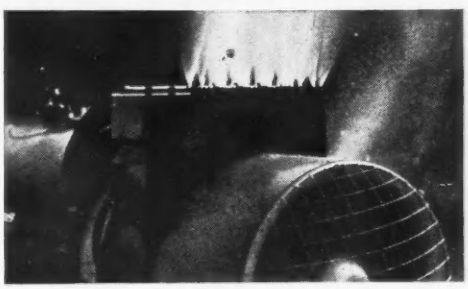

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The 1960-61 Season's Report Of The Federal-State Frost Warning Service

WARREN O. JOHNSON
METEOROLOGIST IN CHARGE
JAMES G. GEORG
LESTER L. BENSON
METEOROLOGISTS

Scope of Service

The U. S. Weather Bureau, Department of Commerce, in cooperation with the Agricultural Experiment Stations of the University of Florida operates the Federal-State Frost Warning Service for all of peninsular Florida. This service has now completed its 26th year of operation, a weather service for the benefit of agriculture.

Character of the 1960-61 Season

Generally the season's weather was somewhat more favorable than that of the past few winters. Warm weather prevailed all of November while December and January and the first half of February were rather cold. Some crop damage occurred in most areas but was generally light. However, the prolonged cold retarded growth and kept pastures in poor condition. The latter part of February and March was warm and only marred by the freezing temperatures and frost on March 11.

The agricultural industry, particularly the citrus grower, will long remember Hurricane Donna which crossed the state from Naples to Daytona Beach on September 10-11. This storm caused considerable loss to citrus . . . fruit blown off trees with the greatest loss being confined to Lee County northward across southern Polk County and lesser amounts in the northern citrus belt. Some significant damage occurred to foliage in exposed areas, however, this damage was rather limited. The tree loss was confined to old seedlings and scattered trees on the outer edge of some groves . . . some were up-rooted.

Donna's heavy rains, along with an extremely high water table resulted in flooding in much of south and central Florida and rainfall following Donna continued into September and October kept fields rather wet until the latter part of October.

November was warm and rather dry. It was very dry in central sections, many stations did not have a measurable amount of rain for the entire month. The first frost of the season, confined only to a small area in the extreme north, occurred November 7 and 8.

December opened rather cold, however, the frost and near freezing temperatures the first five days was confined to the extreme north. The next cold spell, of rather long duration . . from the 14th to the 27th . . had frost and freezing temperatures generally over north and central areas of the state. The only frost in the Everglades occurred on the 17th and 22nd, while the Lower East Coast had some patches of light frost on the 22nd.

Citrus damage was very slight, confined to the colder unprotected locations. Damage to tender truck, strawberry — bloom and berries, pastures and unprotected ornamentals was considerable, while spotted damage occurred to hardy truck in north and central areas on the 17th through the 19th, and 22nd through the 24th, with spotted damage confined to only tender crops in the Everglades. Rainfall in most areas was light.

January was also a cold month with quite frequent frosts in the north. The coldest for all areas was the 21st through the 23rd with temperatures in the low and mid-20s, quite general in the colder locations of north and central areas and even in the backlands of the Everglades, while scattered, mostly light frost with temperatures near freezing was reported from the Lower East Coast farming areas. Citrus damage was again slight and confined to the colder locations.

Frost and freeze damage to tender vegetables, pastures, unprotected ornamentals, sugar cane, and strawberry bloom was spotted with some locally heavy losses in all areas except the Lower East Coast. Hardy truck damage was generally light. The prolonged cold to cool weather retarded growth of most of the young crops, particularly vegetables. However, it enhanced the color of citrus. Rainfall during the month was spotted with below normal amounts in central and above normal in the north while a few places on the Lower East Coast had excessive amounts.

February had a number of moderately cold days and nights the first half of the month. While a warm second half was marred only by one cool period, the 26-27th. All crops made good growth the last half of the month with above normal rainfall in the north, near normal in central and below normal amounts in southern sections of the state.

March: Baseball people look back on March as perfect with warm weather and only a few days of rain. However, many growers will recall the damage to melons, squash, tomatoes, cucumbers and other crops caused by the high winds of 40-45 MPH on the 9th, the frost and freezing temperatures of the 11th, which caused some spotted damage to young citrus trees in the coldest locations, to tender crops in most sections of north and central Florida, increasing to a loss of 50-60 percent of the beans and sweet corn crops in the Everglades. A severe thunderstorm with large hail, some hailstones measured 3 inches across and completely covered the ground in some sections of Lakeland and to north of Plant City, occurred on March 18 with a lesser amount on the 19th.

Orange trees had a heavy bloom and set in early March with some bloom appearing in February. Bloom on grapefruit and tangerines was somewhat later and generally light. Citrus trees were in excellent condition and other crops had made good growth and pastures had greatly improved by the end of the season. April was a cool month and on the morning of the 5th, isolated patches of light frost was reported from some muckland areas of north and central Florida.

Accurate and timely forecasts and warnings with widespread distribution were invaluable to growers throughout the peninsula during the season. Truck growers realized considerable savings from advance warnings by forced harvesting of crops and by taking protective measures against frost and freezing temperatures. Due to advance warnings of heavy rains, growers started drainage pumps early, saving many fields from loss by flooding. Protection of citrus, including nursery stock, paid large dividends although protection was necessary on only a few cold nights. yet these were killing freezes for these crops in some locations. Unnecessary standing by with protection crews was also avoided by accurate forecasts for threatening cold nights.

The Use Of Wind Machines For Frost Protection Of Florida Citrus '60-61

. . . BY . . .
W. R. WALLIS
METEOROLOGIST

Work on determining the usefulness of wind machines for frost protection was continued during the 1960-61 season in the Andre grove near Lake Garfield. The machine used in the study was a 25 H.P. electric Tropic Breeze and the work was conducted with the cooperation of Lake Garfield Nurseries Company, of Bartow, Florida.

The nature of the weather during the 1960-61 season was such that there were very few nights on which a true measure of the effectiveness of wind machines could be made. Nights with temperatures around 32° were numerous in December and January, but external influences, such as wind and clouds, made evaluation of data extremely difficult; if not impossible. The study was further impeded by the fact that a suitable control area was not available. The control area used was a two year old citrus grove adjacent to the experimental grove and it was dissimilar to the experimental grove in both tree size and soil cover.

The night of January 22-23 was the only night of the season on which good data was obtained and could be interpreted. This was the final night of the cold spell which produced the coldest temperatures of the season in Central Florida. Good radiation conditions were present through most of the night with clear skies and light winds with long periods of calm. Observations taken between 7:30-8:00 p.m. show a large inversion. A very slight drift from the northwest was noted in the control area.

The wind machine was activated* at 8:00 p.m. and the effects were apparent almost immediately at stations A and E, while station W showed no noticeable effect. This was evidently due to the northwesterly drift which shifted the effective area of the machine in a southeasterly direction. The temperature profiles show that the machine broke the inversion very efficiently and produced a temperature increase of 4-6° in the layer of air up to 8 feet. The machine went off at 8:45 and the inversion began to build once again.

Around 9:00 p.m. a change in direction of the drift occurred with the resultant drift coming from an east to northeasterly direction. The machine was activated again at 9:40 p.m. and it is interesting to note how the change in the natural wind drift affected the pattern of the machine's influence at the various stations. Induced temperature changes at stations A and E are apparent once again, but they are of considerably smaller magnitude. Station W, which showed no temperature change during the previous running, now shows a good response with a temperature increase of around 4°. The slight drift from the east continued until around 4:15 a.m. and each time the wind machine came on during this period, station W reacted very noticeably while stations A and E reacted to a much smaller degree.

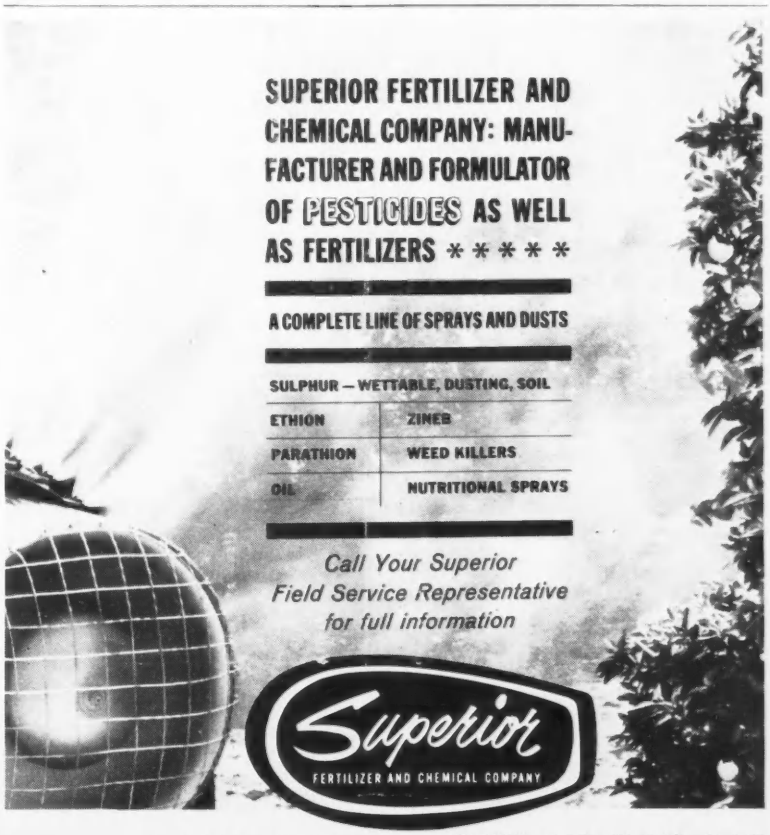
Around 4:15 a.m. an east wind of 3-5 mph began and continued until about 6:00 a.m. Stations A, E and C reacted to the natural wind with temperature rises of 2-3°, but station W showed no immediate change due to its sheltered position in the center of the grove.

Table 1 shows the temperature decline in degrees per hour for three significant periods during the night. A breakdown of the character of each period is as follows:

7-8 pm	Good radiation conditions with little outside influence. Prior to wind machine activation.
8 pm-4 am	Period during which the wind machine was operating and exerting strong influence on the temperature pattern.
4-6 am	Period of natural wind influence.

The table indicates that under good radiation conditions, the rate of tem-

* The wind machine was controlled by a thermostat which was set to turn the machine on when the temperature reached 33°. The machine was turned on manually at 8:00 p.m., but thereafter it was controlled by the thermostat.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perature fall in the control area was smaller than it was at stations E and W when the wind machine was not operating. This condition was reversed during the period of wind machine influence as the control area showed the greatest temperature decline and station W showed a temperature increase. The natural wind from 4-6 a.m. destroyed the inversion and gradually produced isothermal conditions throughout the area.

TABLE 1. Temperature decline in degrees per hour for periods indicated. Plus indicates temperature increase.

STATION	7-8PM	8PM-4AM	4-6AM
C	−2.0	−0.6	+0.9
E	−2.7	−0.2	+0.7
W	−2.4	+0.1	−0.8

January 22-23, 1961 Andre Grove

This resulted in a temperature increase at stations C and E, while station W, which had been kept "warm" by the wind machine, showed a gradual decrease in temperature. After 6 a.m. wind conditions became erratic and the data is difficult to evaluate. At daybreak moderate frost was observed on soil and undergrowth in the area surrounding the experimental grove and in the control area, but no frost formed inside the grove protected by the wind machine.

Durations of cold temperatures are definitely an important factor in any study of methods of frost protection and Table 2 shows the durations for the three stations with thermograph recordings. Since the climatology of the control area is rather indefinite, it is difficult to relate the durations at stations E and W to those of the control station. However, the control station is normally one of the warmest locations in the area and from the table it is obvious that on this occasion the control station was colder than stations E and W. I believe it is safe to assume that this was due to the influence of the wind machine.

The data presented in this paper further validates at least one conclusion derived from earlier work with wind machines.* It presents a good illustration of how the wind machine's area of protection is highly dependent upon the direction of the natural wind drift. Downwind protection is increased while upwind protection is retarded. This fact should be considered when determining the placement and number of machines needed.

* See Weather Forecasting Mimeos 59-10 and 60-23.

TABLE 2. Durations in hours and tenths of hours at and below:

STATION	MIN.	32°	31°	30°
C	30.2	6.5	2.4	0.4
E	30.8	3.8	0.8	
W	31.8	0.8		

January 22-23, 1961 Andre Grove

It has been noted on several occasions that the formation of frost and dew is decreased considerably in an area which is protected by a wind machine. To simply say that this is due to the presence of wind from the machine would be over-simplifying. When the natural wind is calm, the average induced wind speed in the outer regions of the effective area of the wind machine is usually less than 2 mph and practically all of the measurable air movement occurs in short blasts separated by a relatively long period of calm.

Since frost formation can occur in a very short time under calm wind conditions, it seems likely that another mechanism prevents frost formation between blasts from the wind machine. Through the process of transpiration, a leaf builds an area of high humidity near its surface. When the wind is calm the moisture continues to build until it eventually precipitates as frost or dew. The wind acts as a de-humidifier by continually mixing the air and eliminating the layer of high humidity near the surface of the leaf. Natural wind is quite laminar however, and the mixing which occurs with a light natural wind dies down rapidly when the wind becomes calm.

Currents created by the wind machine on the other hand, are turbulent and eddy currents remain long after the main wind blast has passed. Because of this, it is felt that these eddy currents are one of the principal benefits to be derived from the wind machine. The main blast serves to maintain an even distribution of moisture throughout the grove while the small eddy currents prevent a heavy concentration of moisture near the surface of the leaf between cycles of the main blast.

Our thanks to Lake Garfield Nurseries for their cooperation in this work over the past several seasons.

WOOLWORTH ORANGE PURCHASES REACH AN ALL-TIME HIGH

Purchase of oranges for F. W. Woolworth Co. restaurants reached an all-time high of 300,000 cases during 1960, according to a recent report released by H. W. Bode, general supervisor of restaurant operations.

Purchases were for Woolworth's 1,763 luncheonettes and 19 in-store and separate cafeterias, located in all 50 states.

Mr. Bode said "orange purchases are expected to increase in 1961 because Woolworth, which is the world's largest variety store chain, is averaging a new store opening every other business day all with food facilities."

The report also pointed out that Woolworth now "serves an average of 750,000 persons daily, has the capacity to seat 65,762 customers at one time, and is the world's largest commercial dispenser of food prepared and served on the premises. Its restaurant volume is exceeded only by that of the Armed Forces."

NO CHANCE TO ESCAPE OFF REARING TRACTOR

Even if he is a good athlete, the farmer can hardly jump out of the way before his tractor falls on him, once it starts to flip over backwards.

For that reason, says A. M. Pettis, safety specialist with the Florida Agricultural Extension Service, the farmer or other tractor driver should never take a chance. Time and motion studies show that a rearing tractor gives a driver just two-fifths of a second to get out of the way before it flips backward.

The recommended practice of hitching below the tractor axle line is not in itself assurance against tipping backward, adds Pettis. Gunning the engine with the drivewheels mired deep is almost certain to cause trouble. It's much safer to back out.

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FLORIDA VOLCK Soluble Oil Spray . . . . . at 5 gals./500 gals.
Plus ORTHO Zineb 75 Wettable . . . . . at 5 lbs./500 gals.

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VOLCK 90 Flowable Oil Emulsion . . . . . at 7½ gals./500 gals.
Plus ORTHO Zineb 75 Wettable . . . . . at 5 lbs./500 gals.

Florida Growers report top results with VOLCK Oil Sprays

"Purer oil that gives excellent scale control with less chance of fruit burn or foliage damage"..."Gives better scale control than any other I've tried, and it's safer"..."Far superior to any oil I've ever used for scale control." These are just a few of the enthusiastic comments from citrus growers throughout Florida. FLORIDA VOLCK Soluble Oil Spray and VOLCK 90 Oil Emulsion represent the original phytonomic oil sprays, developed in Orlando by the ORTHO research team especially for Florida citrus. Top-quality products like these, plus all the extra benefits of the ORTHO Field Service, are yours when you buy the ORTHO Citrus Spray Program. That's why most growers prefer ORTHO.

Best possible control of scale and rust mites, with minimum shock to trees. FLORIDA VOLCK Soluble and VOLCK 90 Oil Emulsion are highly refined oils, available in 55-gallon drums. Ask your ORTHO Fieldman for the oil best suited to your needs.

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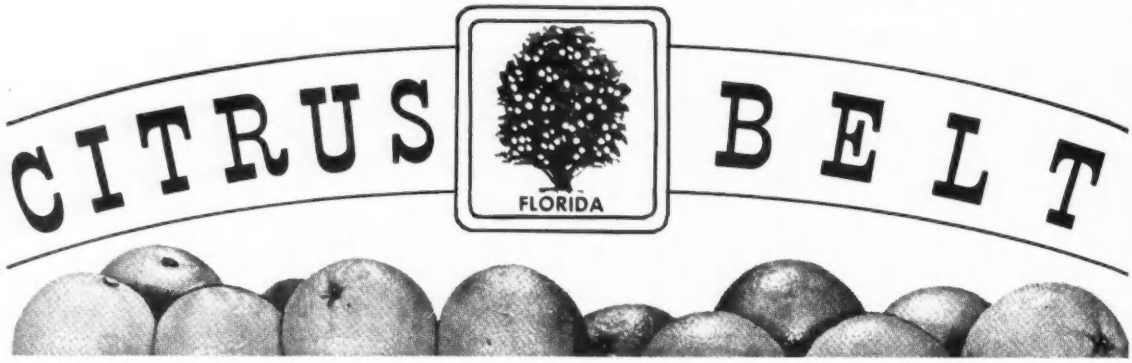
SHORT PICKINGS FROM AROUND THE CITRUS BELT



Each parent and candidate tree in the Budwood Registration Program will be checked annually for the presence of tristeza, under terms of recommendations recently approved by the Budwood Committees. The proposals were made to the Florida State Horticultural Society's Committee for Citrus Budwood Registration and to the Technical Advisory Committee by Dr. T. J. Grant, pathologist with the U. S. Department of Agriculture's Orlando laboratory.

* * * *

The Division of Plant Industry s Technical Committee, which replaces the State Plant Board in name and personnel only, is composed of a representative cross section of Florida's agricultural and horticultural interests.

Appointed to the body in January by Agricultural Commissioner Doyle Conner were two men with citrus backgrounds, a citizen-at-large, and one member each from the forestry, seed, ornamental horticulture and vegetable industries. In the organizational meeting, Vernon Conner of Mount Dora was seated as chairman and Roy Vandergrift, Jr., of Pahokee as vice chairman. At the same time, Dr. W. G. Cowperthwaite, Division Director, was named secretary and Bob Bishop of Orlando, legal counsel.

Vernon Conner represents citrus and Vandegrift the vegetable growers.

Other members and the interests they represent are Foster Shi Smith of Starke, forestry; N. Curtis Peterson of Lakeland, ornamental horticulture; Felix Bullard of Monticello, seed, and W. R. McMullen of Tampa, citrus nurserymen, with Colin English, Sr., of Tallahassee the citizen-at-large. Although it did not figure in the appointment, English, longtime superintendent of public instruction for Florida schols, is listed as a citrus nurseryman.

* * * *

A $6 million purchase of Indian River citrus holdings was announced recently by four businessmen headed by Russel T. Swain, president of First Mortgage Corp. of Florida.

The purchase from the Arthur Vining Davis interests in Miami includes 14 citrus groves totalling 1,800 acres in St. Lucie County near Ft. Pierce.

* * * *

G. B. Hulburt, general manager of Mt. Dora Growers Cooperative announces that prices on Temple oranges, tangelos and valencias will be exceedingly good for this season.

* * * *

The Export Advisory Committee of Florida Citrus Commission has approved a suggestion for consumer surveys in Europe on taste preferences in canned orange and grapefruit juices. West Germany was recommended as one of the best countries in which to make such a test. The proposal would vary the acidity level in four samples of each product.

* * * *

Homer Hooks, general manager of the Florida Citrus Commission, stated that body is using collective advertising to increase the purchasing power of its promotion funds.

* * * *

It is reported that the use of extra trading stamps in the retail market for Florida fresh fruit and other citrus products has been effective in stimulating sales of these products in the Philadelphia area.

* * * *

Recently prices for oranges and grapefruit have continued to make upward trends. Don Lins, sales manager for Florida Citrus Exchange reported prices on fresh oranges and grapefruit both to have shown a marked increase in the past few weeks.

* * * *

Growers who are concerned over the dry spell which has affected the citrus area early in the season have been much heartened by recent rains in this area.

* * * *

Sam Banks, general manager of Lakeland Packing Company, has been reelected president of the Florida Fresh Shippers Assn. Banks commended the shippers for their spirit of cooperation during the Association's first year of operation.

* * * *

W. C. Pedersen, president of Waverly Citrus Growers, expressed the belief that in coming seasons Florida growers will have to find new markets in order to dispose of the growing Florida citrus crop.

* * * *

Two Federal Marketing Agreement committees have recommended extension of present inter-state shipment regulations for both oranges and grapefruit.

* * * *

General manager, Marvin H. Walker, Florida Citrus Canners Cooperative at Lake Wales has announced that his group will undertake a million and a half dollar expansion and modernization program to be completed during the next 18 months.

* * * *

The 1963 acre tract known as the M. A. Smith pasture near Wauchula has been recently sold to the Holly Hill Citrus Cooperative for an estimated consideration of $334,500. Work of clearing the land and digging drainage canals on the property is already under way. It is said the purchasers plan to set groves on the property for resale in small tracts.

* * * *

Pal A. Delameter has been reelected president of the Winter Haven Citrus Growers Association. G. B. Aycrigg was named first vice-president, W. A. Sutton, second vice-president and H. G. Rogers third vice-president. E. S. Horton was reelected general manager and Mrs. Clarice L.

Haixlip was reelected secretary-treasurer.

Directors of the association are R. S. Abernethy, G. B. Aycrigg, George C. Aycrigg, P. A. Delamater, A. M. Hess, C. R. Linebaugh, H. S. Rogers, Winter Haven; W. A. Sutton, Auburndale, and W. W. Owens, Frostproof.

* * * *

A. M. Tilden, long a leader in the citrus industry of Florida died at his home in Winter Haven May 13th. He was the first president of the Florida Clearing House Association, was formerly president of the Florence Citrus Growers association. He was chairman of the committee which was responsible for the establishment of the Citrus Experiment Station at Lake Alfred and the Federal laboratory at Winter Haven.

* * * *

N. Peterson, Jr., Lakeland was named president of the Florida Nurserymen and Growers association recently, succeeding Verne Buck of Apopka, in that office.

* * * *

J. C. Townsend, Jr., agricultural statician, forecasts that the spring drouth which prevailed earlier this season will curtail the volume of fruit in next year's crop. He stated that as of May 1 it appeared that the 1961-62 orange crop appeared to be only about 65 percent of being a normal full crop. Robert W. Rutledge, executive vice president of Florida Citrus Mutual indicated that the coming season will fall far short of the 100 millions box orange crop which has often been forecast.

* * * *

Homer E. Keller, well known in citrus, banking and political circles passed away May 17 at his home in Avon Park. He was well known throughout the industry and over the state.

* * * *

Winter Garden Citrus Products cooperative has announced the installation of its own 6-ounce can manufacturing equipment for frozen juice concentrates. Machinery said capable of producing 80 million cans annually is now in operation at the Winter Garden processing and packing plant.

* * * *

Robert H. Webb has been elected president and treasurer of the Dundee Citrus Growers Assn. at Dundee.

* * * *

In spite of sporadic rains heavy loss has been experienced by the droppage of fruit from citrus trees. Some growers indicate that many of their trees are suffering from wilt and others complain that hot, dry weather is causing the remaining fruit to soften. Many of those in position to know indicate that even if general rains were to start immediately, this season's crop would be considerably less than expected.

* * * *

Florida Citrus Mutual has urged a study by citrus shippers and processors to see if it is feasible to stamp the word "Florida" on all fruit and canned citrus products. The action was in support of a resolution proposed by retiring Citrus Commissioner Tom Swann, Winter Haven.

* * * *

George Copeland, director of fruit and vegetable inspection for the State Department of Agriculture, indicates that there has been a recent reduction in the quantity of fresh fruit shipped to market, while shipments of cannery products has shown a modest increase of 4.65%.

* * * *

Florida citrus growers have nominated six new members for the 7-member growers' administrative committee of Florida Citrus Mutual. Fifteen directors of that organization will retain their posts while three new directors were nominated. The new directors are, Herbert S. Massey, Florida Citrus Commissioner and vice president of Pasco Packing Co.; Chester J. Karst, Orlando citrus grower and grove manager and W. Elton Clemmons, Ocala, general manager of Wartmann Estate groves, at Citra.

* * * *

POWER MOWERS CAUSE MANY ACCIDENTS

The time of the deadly unguided missile has arrived with the lawn mowing season, says the Florida State Board of Health.

"Bits of rock, wood, wire, glass, and other debris are flung at a speed of 200 miles an hour by the whirling blades of the rotary type power lawn mower," said Claudius J. Walker, director of the agency's accident control program. "The National Safety Council says hundreds of people are maimed and many killed each year by these unguided missiles. But power mowers are here to stay, and in most cases are as safe as the manufacturer can make them. The only thing the public can do is to buckle down and follow a few simple safety rules that can mean a lot in preventing tragedy among the family or neighbors."

THANKS!

To the Growers in Central Florida who have used —

FAIRFIELD AGRICULTURAL SLAG

The results reported to us have been very satisfactory —

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(And pass the savings to the Growers)

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In Air, On Land or Under The Sea, Citrus Crystals Produce Fresh Juice

Aboard a swiftly flying jet aircraft, 30,000 feet above the surface of the earth, a stewardess pours citrus crystals into a pitcher, adds water, stirs and proceeds to serve her passengers fresh-tasting pure orange juice.

In a remote area of Indo-China, a medical missionary opens a can of citrus crystals, mixes them with water and serves her husband and children orange juice, a food impossible to obtain in such an isolated area of the world less than three years ago.

Deep beneath the waters of an ocean, the atomic submarine U.S.S. Triton silently cruises along on its histroic journey around the world. And throughout this entire journey, crew members drink both pure orange and grapefruit juice made from citrus crystals.

Citrus juice, one of the finest sources of vitamin C, so necessary to ensure continuing health, would not have been available to any of these people were it not for the development of pure citrus juice crystals, hailed as the third major product breakthrough in the history of citrus processing.

Today, for the first time, it is possible to have citrus juices possessing 96 per cent of the vitamin C content of fresh fruit simply by stirring dehydrated pure juice crystals, requiring no refrigeration, into water.

The story of this remarkable product is a story of faith in an idea, skill to turn the idea into a commercial reality and courage to back both, in the face of many discouragements, with cash. It is also the story of Plant Industries, Inc., a company which operates in the heart of the Florida citrus region and which is now a subsidiary of Salada-Shirriff-Horsey, the international packaged food company.

While citrus is grown in many areas of the world, the fact that it is perishable makes it impossible to supply it in fresh form to many parts of the world, the very areas where lack of vitamin C in a convenient form is the greatest problem.

The achievement of 'instant orange juices' — a dream which had eluded scientists since the First World War — was both a complex and costly endeavor. Fifteen years and more than a million dollars of private and government funds, plus countless hours of frustration went into research and development. Another million dollars was poured into plant facilities. Entirely new machinery and production techniques had to be devised.

Only within the last year and a half has success for the venture appeared assured.

The search for dehydrated orange juice began back in 1917, when U. S. Army nutritionists faced the problem of supplying overseas troops with some form of citrus rations. The answer at the time — a lemon powder containing 20 per cent lemon solids combined with 80 per cent corn syrup solids — lacked both nutrition value and taste-appeal, and the product failed to attract the general public.

It was not until the Second World War that another major attempt was made to produce "dry" orange juice. This time by the U. S. Army working in conjunction with scientists from the Massachusetts Institute of Technology and the U. S. Department of Agriculture. Once again, though various citrus flavored powders were developed, utilizing a multiutde of processes, none had widespread commercial appeal.

The potential success of certain experimental processes developed during this wartime period of research attracted the interest of private industry in the years immediately following the end of the war as a trend toward greater convenience in the preparation of all foods gave impetus to projects to meet this rising public demand.

One firm which had long experience in dehydrating deciduous fruits, Vacu-Dry Co. of Oakland, California, embarked on a research program after the war to develop a process for the production of pure fruit juice solids.

The objective of the company was to produce a non-caking citrus powder with appealing color, aroma and taste; whose vitamin C content would virtually equal fresh fruit; which would be stable over long periods of time under all conditions; which would reconstitute instantly in cold water without prolonged stirring; and which would be economical for commercial production. The need for a product of this type was recognized by the U. S. Army Quartermaster Corps and it provided financial support for a research program.

Of all of the various processes explored during the wartime period, dehydrating citrus concentrates by puff-drying under vacuum seemed to offer the greatest potential.

After many months, and thousands of dollars, the chemists, working in conjunction with scientists from the Western Regional Laboratory of U.S. Department of Agriculture, discovered that the solution lay in short and carefully controlled applications of both heat and refrigeration to juice concentrates under high vacuum. But before this could be done on a commercial scale, the necessary equipment and machinery had to be developed.

The result was a 96-ton vacuum chamber designed by the engineers of Chain Belt Co. of Milwaukee to the specifications of the chemists. This was a formidable piece of equipment with 127 different controls to regulate the temperature inside the vacuum chamber.

The development of the puff-drying process not only included extensive experimentation with the process itself but also comprehensive research into the various types of citrus juices which produced the best results not only from a quality standpoint, but from a production cost factor as well. In both categories, juice from Florida citrus crops gave excellent results. tremendous strides had been taken during this period by the Florida citrus industry to improve the quality of their processed products and in the production of concentrated juices to be sold in frozen form.

In 1953, the continuous vacuum dehydrator process had been perfected to the point where commercial production was possible. About the same time, a small group of people who had been prominently associated with the Florida citrus industry were attracted by the tremendous possibilities of a product such as the new process could turn out. The result of this attraction was the formation in late 1953 of Orange Crystals Inc. to launch a new phase in the citrus industry of Florida.

Construction of a plant commenced in 1954 at Plant City, Florida, in the

heart of the citrus growing area of the state and adjacent to the processing plant capable of producing the quality concentrated juices required for the new product.

The huge dehydrator and accessories, by this time representing an investment of more than $500,000 commenced its journey from Milwaukee to Florida, a trip involving hundreds of extra miles of railway travel as the flat cars were routed around the country to avoid tunnels and low bridges. Within weeks, however, the unique equipment was completely installed. The first, and to this day the only, plant for the production of dehydrated citrus crystals was ready to commence operation.

During the last half of 1954, the operation was devoted to the experimental production of crystals and to overcoming the initial difficulties of operating the new equipment. Commercial production was commenced in 1955 and during that year the company turned out 375,000 pounds of citrus crystals, both orange and grapefruit. First customers included the U. S. Veterans Administration as well as such foreign countries as Sweden, Italy, Switzerland, The Netherlands, Ireland and Chile.

In 1956, control of Orange Crystals Inc. was acquired by a group of prominent businessmen headed by J. William Horsey, a leading food executive who had been associated with the Flordia citrus industry for a number of years and had made a major contribution to earlier development of the industry.

Production was increased when, during the year, the U. S. Army Quartermaster Corps placed the first of a series of increasing orders for field test use by the armed forces. Additional research and development work was undertaken to improve both the quality of the product and production methods.

Problems continued to plague the company and in late 1957 there was a reorganization of the capital structure of the company. Mr. Horsey, together with several prominent Florida businessmen who believed that the dehydrated product offered one of the greatest opportunities for future prosperity in the citrus industry, assumed complete direction of the company.

In early 1959, the company's name was changed to Plant Industries, Inc. J. William Horsey is chairman of the board of Plant Industries, Inc. with George Janner of Tampa as president and T. W. Griggs, also of Tampa and one of those associated with the company throughout most of its history, as vice president and general manager.

The annual report of the company for 1959 revealed that for the first time in its history, its operations had resulted in a profit with rising sales and anticipated orders for the next year virtually ensuring a further increase in the volume of business done by the company.

Today, the plant is working at near capacity, turning concentrated juice from 30,000,000 oranges and grapefruit into close to a million pounds of crystals.

With demand for the quality product of the company steadily increasing, an expansion of production capacity will be required to keep pace.

As production capacity increases, crystals weighing only one-seventh as much as canned juice and only half as much as the equivalent frozen concentrate without the accompanying storage problems, will provide a solution to the problem of supplying this vital food to areas lacking native citrus resources, refrigeration or adequate economical transportation. This applies not only to many foreign countries, but to remote areas in both Canada and the United States as well.

Crystals are also in heavy demand by large-quantity users: the military services, hospitals, summer camps and other institutional groups as well as by a growing list of industrial consumers. Last year, Plant Industries signed a major contract with the U. S. Veterans Administration to supply their hospitals.

For certain special purposes — such as use on airlines, submarines and expeditions — lightweight, nonperishable crystals are proving uniquely suited. KLM (Royal Dutch) Airlines is using crystals for meals in flight. The crew of the U.S.S. Triton, the atomic-powered submarine, consumed 669 pounds of orange crystals and grapefruit crystals during its round the world trip and won the rating of "excellent" from the submarine's supply officer. The crews of the Nautilus and Skate subs, which used crystals in their history-making voyage under the North Pole in 1959, termed the crystals better than frozen concentrate when served cold and requested that they become standard submarine fare.

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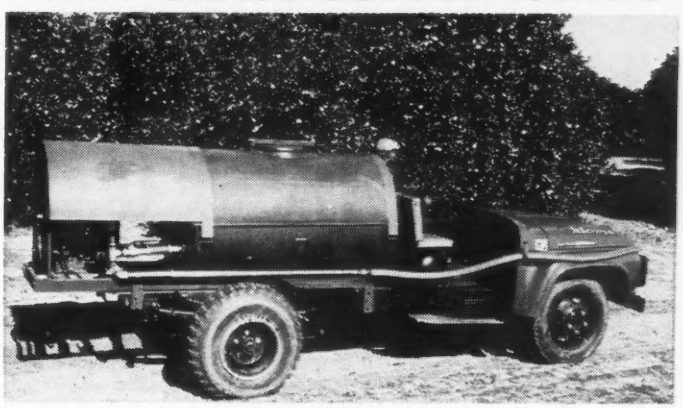

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Planting Citrus On "Flatwoods" Soils

Some Important Considerations

I. GENERAL

The rapid expansion of the Florida citrus industry during the last ten years has resulted in almost complete utilization of the well-drained soils considered most suitable for citrus. Because of this, future plantings will of necessity have to go onto soils that have previously been considered to be marginal for citrus growing. These soils are found in the "flatwoods", which compose the largest land area of peninsular Florida.

The term "flatwoods soils", as used here, are the soils in the low, flat areas, usually underlain with hardpan and on which there is a growth of pines and saw palmettos with occasional bay heads or small swampy areas. There are many different flatwoods soils types, ranging from those with a relatively high fertility level that produce citrus satisfactorily to those that may be entirely unsuitable for citrus production.

Most of the better soils and sites in the "flatwoods" area were selected many years ago by the older residents. Many of the remaining areas have soils suitable for citrus, when properly drained and managed skillfully.

Planting of these soils to citrus is proceeding at a rapid pace without the benefit of extensive research findings and grower experience. Therefore, it is important that growers realize the risk involved. A summary of the best current research, experience and opinion on this subject has been developed by a committee representing the Agricultural Extension Service, the Soil Conservation Service, the Agricultural Experiment Station, and the College of Agriculture.

The problems facing the prospective developer of these lands can be grouped into three broad categories:

1. Site Selection
2. Water Management
3. Horticultural Considerations

II. SITE SELECTION

A. Temperature — Temperature is a prime factor in site selection. Flatwoods are noted for their low temperatures because of their low elevation and poor air drainage. This is often true even in locations south of the current citrus area. Within a given area both colder and warmer locations can be found. Local land elevation is the most important factor affecting temperature in any one location.

An elevation difference of as little as four or five feet above the surrounding area can mean a temperature difference of two to five degrees on calm, clear, cold nights. Locations with swales and depressions should be avoided. Since most cold air moves into Florida from the northwest a gentle slope to the southeast would be preferable but this may be outweighed by other factors.

In addition to appraising the local site, seek the answer to these questions. Is the general area a warm or cold one? If cold, can heaters, wind machines or supplemental cold protection make it satisfactory for citrus? The Federal-State Frost Warning Service, Lakeland, Florida, can be of material help in answering these questions.

B. Soil Types — Citrus can be grown on almost any "flatwoods" soil, but the question is whether a given soil can be made to produce citrus profitably. The answer is not clear-cut at this time.

Many of the "flatwoods" soils are strongly acid and deficient in practically all plant mineral elements, including the trace elements. This is especially true of soils having thick, light colored sand layers. In acid "flatwoods" soils, the color and thickness of the surface soil, the depth to the organic stain, or pan, and the color of the subsoil will influence the growth of citrus. The soils with the greater organic matter content usually have the greater water and nutrient-holding capacity. Most of these soils contain a leached, white sand layer over an organic pan. In general, the whiter the sand, and the thicker the leached layer above the pan, the poorer the land for citrus.

The citrus roots need to extend throughout a depth of at least three feet of soil. This means that the water table in the soil must be kept lower than three feet, except for very short periods of time. Not all "flatwoods" soils are suitable for this degree of drainage and root penetration. Some of the soil types now being managed satisfactorily in citrus include: Scranton, Adamsville, Bradenton, Parkwood, Pompano, Felda, Sunniland, Leon, Immokalee and Ona.

III. WATER MANAGEMENT

Prospective growers in searching for a planting site in the "flatwoods", many make the mistake of thinking in terms of drainage only; equally as important is the provision for adequate irrigation due to the limited root system of citrus growing on these soils.

A. Drainage — Possibly the first consideration would be: Does the property in question have a natural outlet adequate to properly drain the soil? If not, what are the possibilities of securing easements, rights-of-ways, etc., for artificial or man-made outlets? **There must be adequate provision for the removal of excess water.** The mere fact that the land can be ditched, dyked and pumped is not sufficient. The adjacent lands are likely to be planted with the same thought in mind, and very quickly there is an excess of water and no place to put it. In large areas of poorly drained soils, not in drainage districts, this is all too frequently overlooked.

The water table should be held as nearly constant as possible for the maximum growth of citrus. The time element is the critical factor in a fluctuating water table. Free water in the root zone for a few days will do no great damage, but flooding for a week will likely result in severe damage. It is our opinion that the minimum depth of rooting for satisfactory growth would be three feet. This will vary with soil types but a good rule of thumb would be three feet — greater depths, of course, are more desirable.

Where shallow water tables are allowed to persist, the rooting zone of citrus is limited to the soil area above the water table where the roots carry on their normal metabolic processes. An important consideration here, and one frequently overlooked, is that it is the depth of rooting which determines the amount of water which will be available to the plant during periods of drought. In other words, the better these soils are drained during wet weather, the less will be the need for irrigation during dry weather.

It must be recognized that adequate drainage encompasses both surface and subsurface drainage. Surface drainage is provided to remove

excess surface water rapidly during and after heavy rains. This is usually accomplished by ditches. Water which soaks into the soil and raises the water table must be removed by subsurface drainage.

This can be done through the use of tile or open ditches. Both surface and subsurface drainage are necessary for water control in most of the poorly drained soils. The subsurface drainage system must keep the water table at least three feet below the soil surface — except for a few hours at a time.

It should be kept in mind that capillary rise will water-log soil about a foot above drainage level, or water table and to have three feet of soil available for root development, drainage would have to be at least four feet deep.

B. Irrigation — On soils which require draining, irrigation is usually necessary because of the limited root penetration. The depth of rooting and the soil physical properties determine the amount of water which will be available to the plant during periods of drought. Adequate drainage in wet weather results in less frequent need for irrigation.

In general, sprinkler irrigation systems are more suitable than subsurface or ditch systems.

C. Soil Erosion — Most "flatwoods" soils selected for citrus will have little or no erosion if reasonable care is exercised in providing for surface drainage; however, poorly designed systems of bedding and discing are a constant source of erosion and expensive "wash-outs".

The design and construction of an adequate water management system is expensive and requires a great deal of technical skill. In the long run, the employment of professional engineers will be the most economical practice.

IV. HORTICULTURAL PRACTICES

The special management practices on these marginal soils beyond that required on well drained soils increases the cost of production. In addition, citrus on "flatwoods" soils has been found to produce appreciably less than that produced by trees on deep, well-drained sands of the ridge section.

A. Rootstocks — Information on rootstocks in relation to "flatwoods" soils is limited. The Committee is of the opinion that rough lemon stocks, because of the large crop they tend to produce, would be preferred, provided the specific location is sufficinetly warm and the drainage system adequate. If this is not the case, sour orange or Cleopatra stocks should be used. Available information is too limited to make statements relative to the use of Trifoliate orange as a stock for these soils.

B. Varieties — Since most "flatwoods" areas are known to be somewhat colder than surrounding high ground the grower should seriously consider planting early maturing varieties so that the crop may be harvested prior to damaging cold. Where it is known that the location is sufficiently warm, Valencias and other late varieties may be planted. The productive life of all varieties planted on shallow soils can be expected to be somewhat shorter than cirtus planted on deep well drained soils.

C. System of Bedding and Soil Management — Planting citrus on high single beds is a common source of trouble, permitting root damage by cultivation, exposure and lack of moisture. Such conditions aggravate the water problem by shedding rain or irrigation water away from the rooting area very quickly. Low beds and multiple row beds appear to be more practical and certainly they lend themselves to a more economical system of cultivation and management.

Practical experience dictates that beds should not necessarily be established in the direction of maximum fall as this may lead to erosion and a constant problem of repairing "wash-outs".

D. Special Management Problems — In making the original lay-out of the land, thought should be devoted to the system of cultivation and the type equipment to be used in future years. Ample turn rows, driveways, etc., for handling harvesting equipment, sprayers, fertilizer spreaders and other equipment should be provided. Much of the equipment used in the "Ridge" area of the state is not suitable for use in these specialized groves and some thought should be devoted to the use of different or modified equipment.

V. SUMMARY

Citrus can be grown on many of the "flatwoods" soil types of Florida. On the average, the management problems will be greatly increased and it will cost more to grow citrus on these soils than on those in the "Ridge" section of central Florida. The yields will probably be lower and the net profits will in all probability be less.

Prospective owners or developers of these soils, who are not fully acquainted with Florida soils and climate, are strongly urged to seek competent advice before planting "flatwoods" soils to citrus.

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The Fruit Areas Of America ...FLORIDA

Reprinted from American Fruit Grower

. . . BY . . .
A. H. KREZDORN
UNIVERSITY OF FLORIDA,
GAINESVILLE

Probably in no state in the nation is the economy as dependent on its fruit industry as in Florida.

The type of fruits produced are varied. In the north and northwest section are the tung and pecan orchards. Commercial tung acreage is on the decline because of low monetary returns and this tendency is unlikely to change in the near future.

The development of pecan plantings has been slowed by the failure resulting from poor site and variety selection. However, there are many acres of good land and with the availability of such scab-resistant varieties as Elliot, Desirable, Curtis, and Stuart, an expansion potential is very real.

Other tree and bush fruits common to temperate zone areas are not grown to any extent, but a vigorous breeding program in Florida Agricultural Experiment Station has reached a stage where commercial peach and blueberry production is promised for the very near future.

Also, both the recently released Florida variety, Flordagrand, and the Texas release, Brazos, make commercial blackberry production feasible at least as far south as Tampa. There was once a commercial grape region in Florida, but lack of a market for the adapted varieties resulted in its failure. A grape grower's association still exists and an active breeding program is being carried out.

Winter strawberry production, almost entirely of the Florida 90 variety, is well down from its peak and there is no portend of large increases in planitings of this fruit.

The strawberry center of Florida is at Plant City in Hillsborough County where about 2000 acres are in production.

The extreme southern strawberry area near Miami has about 400 to 500 acres with about 150 of these in a single planting. For the most part, berries from this area are air expressed to New York markets.

In another small area between Gainesville and Jacksonville in north central Florida, there are 200 to 300 acres of strawberries.

Although at present Florida has little more than 2000 acres of strawberries, at one time it had several times this many acres. The labor shortage is primarily responsible for the decrease.

The first berries shipped out of Florida to northern markets in early to mid-December come from the Plant City and Miami areas. From then until April, Florida has the strawberry market pretty much to itself even though its production is relatively small.

Swing far to the south, to the Miami area and to warmer locations along the east and west coasts, and Florida fruits go truly exotic. Avocados are produced in substantial quantities and to a lesser extent mangos and lychees. The mango is unsurpassed as a dessert fruit, but urban developments in its limited area of adaptability preclude much expansion.

Avocados and lychees are adapted not only to the tropical locations but to much of the citrus area. However, neither can compete in monetary returns with citrus.

Such fruits as star-apple, sopote, sapodilla, canistel, tamarind, akee, jaboticaba, pineapple, papaya, guava, and others whose names are unfamiliar to the northern grower are commonlace as dooryard fruits and in some instances as small commercial plantings. There is little hope that any large increase in plantings of these tropical fruits will develop. Many are grown as novelties and have rather limited appeal.

With citrus the story changes. The Florida citrus industry is unsurpassed in size and stability in this country. Comparisons rather than production figures most adequately portray its magnitude. The orange production in Florida is greater than the apple production in the entire United States.

Grapefruit production exceeds that of the nation's pears, and the tangerines produced surpass the combined totals for sweet and sour cherries. In addition, there are 2000 to 3000 acres each of Murcotts, tangelos, and lemons and 10,000 acres of limes.

There are four distinct citrus regions: The most imposing is in the central part of the state on a high sandy ridge of rolling hills that are interspersed with thousands of lakes. Except for scattered areas of lowland the citrus plantings are continuous for 150 to 200 miles. This is known as the Ridge area and it is far greater in size and higher in productivity than the others.

Both topography and the lakes are highly important features, for it is the combination of good air drainage and the warming effects of the lakes that offer the best cold protection during freezes. The soils are sandy and well drained but have little moisture or mineral-holding capacity. However, the heavy, fairly-well-distributed rainfall, the deep root systems developed, and the plentiful supply of both underground and surface water for irrigation preclude any real moisture problem.

Another major area, known as the Indian River region, lies along the central part of the east coast. Its proximity to the ocean and the Gulf stream make it very warm. Previous to development, much of the land was continuously or periodically under water. Both a master water drainage system and individual drainage systems are necessary.

Because of difficulties of weed control in the ditch banks and other management factors attendant with the drainage problem, close attention to grove care is needed. However, a particularly high-quality fruit, due largely to the sour orange rootstock used, is produced and demands a premium on the market.

Directly across the state on the west coast is another area of lesser size. This is a very old area and both well- and poorly-drained soils are present. Where needed, drainage is provided on an individual basis.

The only other well-delineated area is in the Miami-Homestead section in Dade County. Because of the decreased frost hazard, it is a Tahiti or Persian lime area.

The various systems under which the groves are managed are worthy of note. Citrus marketing and production co-operatives manage about 34% of the acreage. These include both small and relatively large growers, but small growers of 5 to 50 acres are particularly attracted to this sys-

tem. Here a board of directors is elected by the growers and a trained production and marketing staff hired.

One of the many fine co-operatives available to growers is Haines City Citrus Growers Association. Under R. V. "Red" Phillips, general manager, this organization has been extremely active in assisting in the development of bulk handling and mechanized approaches to harvesting.

This co-operative includes about 170 growers and 5100 acres of groves, grove equipment, a modern fertilizer plant, harvesting equipment, and a packing house. Much of their production is processed by Florida Citrus Canners Co-operative of which Haines City Association is one of several stockholders.

Approximately 19% of the acreage is controlled by large corporations such as Minute Maid, Libby, McNeill and Libby, and others. Minute Maid Corporation alone has expanded from an initial 3000 acres in 1949 to over 30,000 acres.

About 24% of the acreage is managed by individual owners. This type of management is more commonplace in the Indian River area than on the Ridge. Typical of such growers is Dale Talbot, of Vero Beach, who has been growing citrus on the river since 1928. Dale owns and manages 190 acres of grove that is about half grapefruit, with the remainder in oranges, tangelos, and Temples.

About 23% of the acreage is managed by caretakers, whose services range from custom work to a complete production, harvesting, and marketing service. One of the largest, Karst, Inc., of Orlando, offers complete caretaking from clearing and planting to selling fruit. This organization manages about 15,000 acres.

The citrus industry has not attained its current prosperous status easily. Freezes and hurricanes have periodically caused widespread damage. As freezes pushed citrus south onto the mineral-deficient soils of the Ridge and chemical fertilizers replaced manures, research in mineral nutrition periodically bailed the grower out of trouble and pointed the way to increased production.

At one stage, an infestation of citrus canker threatened the plantings. In an epic example of co-operation between growers, research, extension, and regulatory agencies, this disease was eliminated.

The industry has survived the speculative land boom of the late 20's and a myriad of psuedo experts and dishonest caretakers. While some of the current land developments are still speculative, the industry as a whole has developed a high sense of integrity.

Florida Citrus Commission and Florida Citrus Mutual have added stability and direction to the industry and produced an organized advertising program.

Technological developments such as citrus concentrate and chilled fresh juice have provided the needed inertia when overproduction threatened. The development of dehyrdated citrus pulp as cattle feed not only utilized a waste material but solved a tremendous waste disposal problem.

Despite the favorable position it enjoys today, the citrus industry is faced with a battery of serious problems such as spreading decline, virus diseases, and problems inherent in a current rapid expansion of citrus onto flatwoods and marsh land. Also, the demand for easily prepared foods poses a problem to the fresh fruit industry. Here a successful future may be with the development and promotion of easy-to-peel varieties with high dessert quality, such as the recent hybrid releases of USDA, and the development of better handling and decay control measures.

Characteristically, the growers are facing the future with vigor and imagination. Land previously considered worthless is being drained and planted with confidence and occasionally someone casts a furtive eye to colder locations to the North. Certainly no one knows what the future holds but anyone acquainted with the industry must be impressed with its history of development and fascinated by its challenging future.

Clements Elected President Florida Citrus Nurserymen

L. W. CLEMENTS, JR.

A Polk county citrus nurseryman, L. W. Clements, Jr., of Lake Garfield Nurseries Company, Bartow, was elected president of the Florida chapter of the American Association of Nurserymen at the annual Spring meeting of the chapter at Miami Beach May 19-20.

Kenneth Schulz, of Polk Nursery Company, Winter Haven, was elected secretary-treasurer of the chapter, while Raymond Oglesby, Oglesby Nursery, Hollywood, was named vice president.

Clements and Oglesby were elected to serve as delegates from the Florida chapter to the 86th annual convention and trade show of the American Association of Nurserymen to be held in Washington, D. C., July 15-20. The AAN is the oldest trade organization in the United States.

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SOUTH HILLSBOROUGH, MANATEE AND SARASOTA COUNTIES

R. C. Revels, Jr.
P. O. Box 3332, Apollo Beach, Fla.

Tomato growers are in full swing harvesting the spring crop of tomatoes now. Most of the growers have picked two or three times and it looks like the crop will be off about 20 to 25% from last year. The fields have gone down a lot faster this year than last year. The one good thing that has prevailed is that they have not had any rains to hurt the fruit during the harvest so far. Most of the fields have set a big top hand of fruit and if the vines hold up long enough, they should be picking for another two or three weeks.

Summer applications of fertilizers are being applied now where the groves have had rain, however in the dry sections some growers are holding off, waiting on the rains. Most groves are holding up pretty good. Light disking to mulch the top soil helps to bring up the moisture and growers are running over their groves at least once every two weeks. Mites have been bad this spring and where the spray didn't contain some miticide to kill Spider mites some damage has been done to the trees. It won't be long before summer oil time and if Spider mites are evident, be sure to use a miticide to take care of them. Aphids are beginning to show up now in some areas.

HIGHLANDS AND POLK COUNTIES

R. E. Lassiter, Jr. & J. E. Rubush
P. O. Box 1304
Winter Haven, Fla.

At the time of this writing some of the areas that had rain two weeks ago are now beginning to feel the effects of dry weather once again. If rain does not come in the next few weeks we will be in need of more irrigation.

Growers should not be overly alarmed at the droppage of smal fruit as the tree is in the process of natural selection after a heavy bloom.

We find ourselves in the middle of the summer fertilizer application, and are beginning to concern ourselves with the summer scalicide sprays. Scale has not been a widespread problem lately, however, to keep populations low it is advisable to apply a summer scale control. Rust Mite populations are very definitely on the increase at this time, and these mites should be kept at a low level before the summer scalicide is applied. We have found Texas and Six-Spotted Mites to be a problem during the last month. The warmer weather seems to be helping in the control of these mites.

WEST HILLSBOROUGH, PASCO AND PINELLAS COUNTIES

Calvin P. Lloyd, III
Tampa, Fla.

The dry weather in this area has done quite a bit of damage. There is quite a bit of fruit drop in most of the groves, this being worse in groves that were not irrigated. In some of the worst groves the trees have shed all their fruit and some leaves. The trees that are hardest hit by the dry weather are the trees that the water has damaged the root system last year.

The rust mites are quite bad in some groves already, but most of the groves will hold until the usual oil-zineb summer spray. There are quite a few groves that the red spiders and Texas citrus mites are still hanging on in, but they are not at a dangerous level.

As your Lyons field representative, I stand ready to help you with your grove problems, so do not hesitate to call.

NORTH CENTRAL FLORIDA

V. E. Bourland
Winter Garden, Fla.
Phone 107

Weather has been hot and windy with cool nights. Lots of trees in wilt and fruit dropping very bad. Young trees are being watered regularly. Very little rain, too dry for spraying and rust mites are showing up in lots of groves, but growers are watching and standing by with their dusters.

Truck farmers are cleaning up their winter crops; pepper, eggplant are looking very promising.

SOUTH POLK, HIGHLANDS, HARDEE AND DeSOTO COUNTIES

C. R. Wingfield
Phone: Glendale 3-4537
Avon Park, Fla.

May has turned out to be another dry month. About the middle of the month we had some spotted rains ranging from ½ to 2 inches but we were so dry at the time that it did not last very long. Some growers never stopped their irrigation plants while others had a few days grace.

These conditions have slowed the summer fertilizer applications somewhat but those with plenty of moisture will go ahead on schedule. Our spring flush of growth was good and ample plant food should be given trees to support this growth and carry it through the summer.

Valencias are moving right along but are picking out light. The new crop is sizing fairly well considering moisture conditions.

HILLSBOROUGH, PASCO AND SUMTER COUNTIES

C. W. Dean
Gibsonton, Fla.
Phone Tampa 40-2592

We had a very welcome rain in this area this week, May 8th. Growers I have talked with up to time of this writing all said they could use more. Citrus was beginning to suffer considerably with quite a lot of leaf droppage. Fruit was beginning to shower down. Some growers have been irrigating for several weeks and don't have the damage of those that aren't equipped for irrigation.

It is time for the summer application of fertilizer to the groves. We would like to stress the importance of this application as it is the main application to grow the young crop of fruit on the tree as well as keep the tree itself in a good growing condition. A fertilizer with good natural organic materials is recommended. If any one of us here at Lyons Fertilizer Co. can be of service to you, don't hesitate calling us. Service and results are our policy.

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Uncle Bill Says:

The 1961 citrus season is nearing a close, and after the initiation we had with a very windy visit from Hurricane Donna at the beginning of the season, the over all situation has been far from the disaster we first envisioned . . . comparatively good prices has prevailed throughout the season and the feller who has a good supply of Valencias left is most fortunate indeed.

Fact of the matter is that with all the problems and troubles us folks engaged in raisin' citrus usually fare purty well in spite of drouths, dry spells, pests, adverse markets and every other kind of near calamity . . . in spite of all the troubles we've had since the really disasterous 1895 freeze us growers, as a class, has prospered much better than the average.

They was a time when a lot of folks was much upset over the possibility of our producin' too much citrus fruit, but in the years since this thought bothered some folks we have been planting a lot of new groves every year and the annual production of all Florida citrus crops the past season amounted to more than 123,000,000 boxes, of which around 88,000,000 was oranges, about 31 million boxes of grapefruit and five and a half million boxes of tangerines . . . and yesterday we heard a prediction from a man who should know that in a few years we'd have a market fer 125 million boxes of oranges.

The persistent campaign of advertisin' which has boosted the vitamin advantages of citrus, the growth of canned fruit usage and the tremendous sale of frozen citrus concentrate and the ordinarily prosperous condition of the country has kept the demand for Florida citrus generally at a high level, and as the already fine quality of Florida's citrus is continued it is entirely reasonable to presume that the market fer our fruit will continue to increase as the years go by.

Don't forget that Lyons Fertilizers Produce Maximum Crops of Finest Quality . . . a lot of Florida's most successful growers will vouch for that fact.

The automobile editor of a New York newspaper has succeeded in powering a car with orange juice. Working with a research company, he extracted the juice from 20,000 seedless oranges and fed it through a special device into the carburetor. The juice got him up to 25 miles per gallon on the road. Ah, energy!

America's increased population is expected to require 54 percent more truck crops by 1975.

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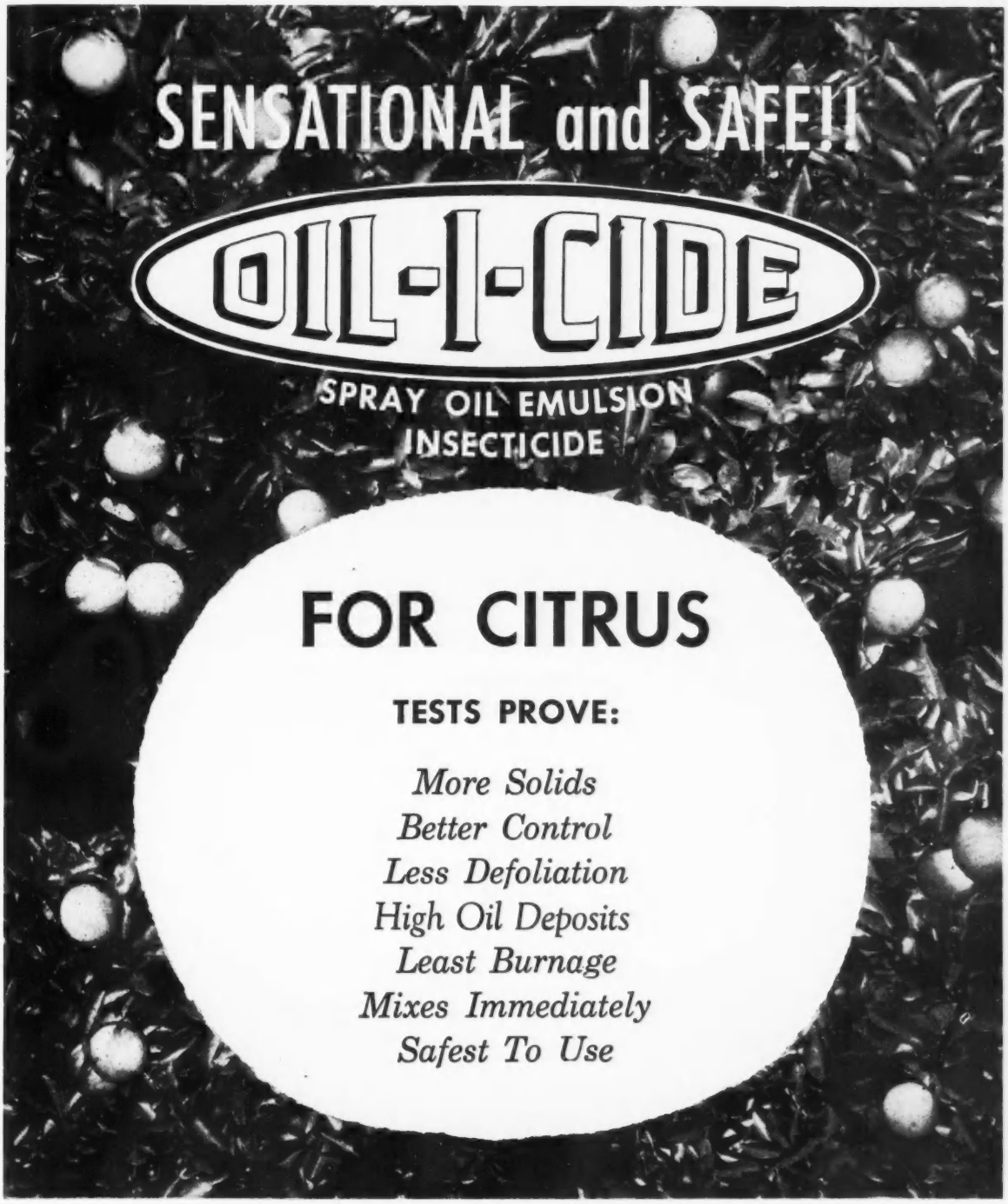

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